

Application No.: 09/780,295

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AMENDMENTS TO THE CLAIMS

Claim 1 (currently amended): A semiconductor light emitting device comprising,

a substrate;

an n-type layer provided on the substrate and made of a nitride semiconductor material;

a multiple quantum well structure active layer including a plurality of well layers each made of $\text{In}_x\text{Ga}_{(1-x-y)}\text{Al}_y\text{N}$ ($0 \leq x, 0 \leq y, x+y < 1$) and a plurality of barrier layers each made of $[\text{In}_2] \text{In}_s\text{Ga}_{(1-s-t)}\text{Al}_t\text{N}$ ($0 \leq s, 0 \leq t, s+t < 1$), the multiple quantum well structure active layer being provided on the n-type layer, and

a p-type layer provided on the multiple quantum well structure active layer and made of a nitride semiconductor material,

wherein the p-type layer contains hydrogen, and the hydrogen concentration of the p-type layer is greater than or equal to about 1×10^{16} atoms/cm³ and less than or equal to about 1×10^{19} atoms/cm³, and

the p-type layer contains Mg and the Mg concentration of the p-type layer is greater than or equal to about 4×10^{19} atoms/cm³ and less than or equal to about 1×10^{21} atoms/cm³.

Claim 2 (cancelled)

Claim 3 (original): A semiconductor light emitting device according to claim 1, further comprising a p-type electrode for applying a voltage via the p-type layer to the multiple quantum well structure active layer, wherein the p-type electrode contains atoms selected from the group consisting of Pd, Sc, Y, La, Ce, Pr, Nd, Sm, Eu, Tb, Ti, Zr, Hf, V, Nb and Ta.

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Claim 4 (cancelled)

Claim 5 (original): A semiconductor light emitting device according to claim 1, the hydrogen concentration of the n-type layer is less than or equal to 1×10^{17} atoms/cm³.

Claim 6 (previously presented): A semiconductor light emitting device according to claim 3, the hydrogen concentration of the n-type layer is less than or equal to 1×10^{17} atoms/cm³.

Claim 7 (original): A semiconductor light emitting device according to claim 1, further comprising a layer including Al, wherein the p-type layer is provided, via the layer including Al, on the multiple quantum well structure active layer.

Claim 8 (original): A semiconductor light emitting device according to claim 7, the layer including Al has a thickness of about 5 nm or more.

Claim 9 (cancelled)

Claim 10 (cancelled)

Claim 11 (currently amended): A semiconductor light emitting device comprising a substrate;

an n-type layer provided on the substrate and made of a nitride semiconductor material;

a multiple quantum well structure active layer including a plurality of well layers each made of $\text{In}_x\text{Ga}_{(1-x-y)}\text{Al}_y\text{N}$ ($0 \leq x$, $0 \leq y$, $x+y < 1$) and a plurality of barrier layers each made of $[\text{In}_2]$

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$\text{In}_s\text{Ga}_{(1-s-t)}\text{Al}_t\text{N}$ ($0 \leq s, 0 \leq t, s+t < 1$), the multiple quantum well structure active layer being provided on the n-type layer; and

a p-type layer provided on the multiple quantum well structure active layer and made of a nitride semiconductor material,

wherein the p-type layer contains hydrogen, and the hydrogen concentration of the p-type layer is greater than or equal to about 1×10^{16} atoms/cm³ and less than or equal to about 1×10^{19} atoms/cm³, and

the n-type layer contains hydrogen, and the hydrogen concentration of the n-type layer is less than or equal to 1×10^{17} atoms/cm³.

Claim 12 (previously presented): A semiconductor light emitting device according to claim 11, further comprising a p-type electrode for applying a voltage via the p-type layer to the multiple quantum well structure active layer, wherein the p-type electrode contains atoms selected from the group consisting of Pd, Sc, Y, La, Ce, Pr, Nd, Sm, Eu, Tb, Ti, Zr, Hf, V, Nb and Ta.

Claim 13 (previously presented): A semiconductor light emitting device according to claim 11, further comprising a layer including Al, wherein the p-type layer is provided, via the layer including Al, on the multiple quantum well structure active layer.

Claim 14 (previously presented): A semiconductor light emitting device according to claim 13, the layer including Al has a thickness of about 5 nm or more.

Claim 15 (previously presented): A semiconductor light emitting device according to claim 11, wherein the p-type layer contains Mg, and the Mg concentration of the p-type layer is greater than or equal to about 4×10^{19} atoms/cm³ and less than or equal to about 1×10^{21} atoms/cm³.

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Claim 16 (cancelled)

Claim 17 (currently amended): A semiconductor light emitting device, comprising:

a substrate;

an n-type layer provided on the substrate and made of a nitride semiconductor material;

a multiple quantum well structure active layer including a plurality of well layers each made of $\text{In}_x\text{Ga}_{(1-x-y)}\text{Al}_y\text{N}$ $\text{In}_x\text{Ga}_{(1-x-y)}\text{Al}_y\text{N}$ ($0 \leq x$, $0 \leq y$, $x+y < 1$) and a plurality of barrier layers each made of $\text{In}_s\text{Ga}_{(1-s-t)}\text{Al}_t\text{N}$ $\text{In}_s\text{Ga}_{(1-s-t)}\text{Al}_t\text{N}$ ($0 \leq s$, $0 \leq t$, $s+t < 1$), the multiple quantum well structure active layer being provided on the n-type layer, and

a p-type layer provided on the multiple quantum well structure active layer and made of a nitride semiconductor material,

wherein the p-type layer contains hydrogen, and the hydrogen concentration of the p-type layer is greater than or equal to about $1 \times [1016]] \ 10^{16}$ atoms/cm³ and less than or equal to about $1 \times [1019]] \ 10^{19}$ atoms/cm³,

further comprising a p-type electrode for applying a voltage via the p-type layer to the multiple quantum well structure active layer, wherein the p-type electrode contains a combination of Au and $[[P]] \ Pd$, and

wherein the p-type layer contains Mg, and the Mg concentration of the p-type layer is greater than or equal to about 4×10^{19} atoms/cm³ and less than or equal to about 1×10^{21} atoms/cm³.

Claim 18 (currently amended): A semiconductor light emitting device, comprising:

a substrate;

an n-type layer provided on the substrate and made of a nitride semiconductor material;

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a multiple quantum well structure active layer including a plurality of well layers each made of $\text{In}_x\text{Ga}_{(1-x-y)}\text{Al}_y\text{N}$ $\text{In}_x\text{Ga}_{(1-x-y)}\text{Al}_y\text{N}$ ($0 \leq x$, $0 \leq y$, $x+y < 1$) and a plurality of barrier layers each made of $\text{In}_2\text{Ga}_{(1-s-t)}\text{Al}_t\text{N}$ $\text{In}_s\text{Ga}_{(1-s-t)}\text{Al}_t\text{N}$ ($0 \leq s$, $0 \leq t$, $s+t < 1$), the multiple quantum well structure active layer being provided on the n-type layer, and

a p-type layer provided on the multiple quantum well structure active layer and made of a nitride semiconductor material,

wherein the p-type layer contains hydrogen, and the hydrogen concentration of the p-type layer is greater than or equal to about $1 \times [1016] 10^{16}$ atoms/cm³ and less than or equal to about $1 \times [1019] 10^{19}$ atoms/cm³,

further comprising a p-type electrode for applying a voltage via the p-type layer to the multiple quantum well structure active layer, wherein the p-type electrode contains a combination of Au and $[P]$ Pd, and

wherein the n-type layer contains hydrogen and the hydrogen concentration of the n-type layer is less than or equal to 1×10^{17} atoms/cm³.

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